flyWithCE Navigator

User's manual

Version: 3.10
Last revision: 29 May 2008

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13. USE OF THE NAVIGATOR PROGRAM
Program Navigator is not certified as a height reference instrument, main navigation instrument or IFR navigation instrument.

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2. Install and register Navigator

2.1. Download Navigator

Start by downloading Navigator from the following web site:

www.flyWithCE.com/download.shtml

After you select the link of the desired program the message box will appear. Select *Save to disk* option and then select the directory on your local hard drive.

You should occasionally check this web site for new releases and newsletters. Newsletters may contain more details on certain features – this is to keep this manual as short and simple as possible. If you would like to receive an Email to advise you of changes you should register on the flyWithCE mailing list.

2.2. Install Navigator

To install Navigator follow this procedure:

1. Connect the Pocket PC (iPAQ) to the desktop computer.
2. Open the File explorer and find the saved file.
3. Select file with double-click.
4. Follow the install wizard.

Note: The program that you have downloaded from the web site is a Windows installation program. Do not copy this program to the Pocket PC. Follow the installation procedure.

You can use Navigator Free unregistered with valid NMEA GPS source or also in simulator mode. The Navigator Free has some restrictions, but is an excellent simple moving map solution to complement existing instruments.

2.3. Register Navigator

During the registration procedure you must enter the registration code, which you will find in *Help - Register* dialog window. Depending on usage of Navigator you will determine your preferred registration option:

Registering to the Pocket PC
Find and enter the registration code, displayed next to the *Pocket PC* label. You will be able to use Navigator on your Pocket PC with any instrument.

Registering to storage card
Find and enter the registration code, displayed next to the *Storage Card* label. This will allow easy upgrade of user hardware – memory card can simply be transferred to new Pocket PC device.

Registering to the instrument
Find and enter the registration code, displayed next to the *Instrument* label. This code is displayed only when your Pocket PC is connected to the instrument. This registration is operable with the following systems:

- LX Navigation (LX20, Colibri, LX160, LX1600, LX5000, LX7000
- Zander (SR940, SR941)

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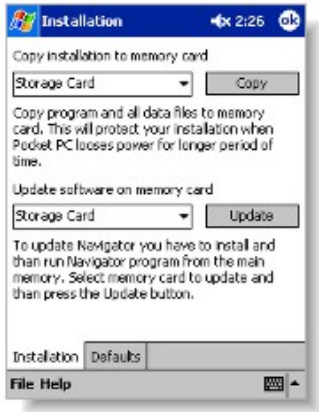
Registration to the instrument will is useful for gliding clubs or pilots who share the same aircraft or instruments. They will need to buy only one license for *each* instrument. Club members will then be able to enter the registration key for each instrument and will, thereby, be able to use Navigator with all instruments registered by the club.

Enter registration key
After registration you will receive the Email message with the registration key which you should enter in *Help – Register* dialog window. Enter the key in the edit box in the middle of the window and then press *Register* button. You can enter one or several registration keys.

2.3.1. Memory Card Installation

It is advisable to use this feature to transfer Navigator from Pocket PC memory to memory card. This will preserve both main memory space and Navigator program, files, settings and databases if Pocket PC battery is completely discharged.

Navigator is available pre-installed on memory card. Check flyWithCE order page http://www.flywithce.com/order.html for details.


Installation
2:26
Copy installation to memory card
Storage Card
Copy
Copy program and all data files to memory card. This will protect your installation when Pocket PC looses power for longer period of time.
Update software on memory card
Storage Card
Update
To update Navigator you have to install and than run Navigator program from the main memory. Select memory card to update and than press the Update button.
Installation
Defaults
File Help

2.4. Getting Started

This section will allow you to get started and use Navigator in flight mode or in simulator mode, all features are available in simulator mode to allow user to gain experience before flying with Navigator.

2.4.1. Setup Navigator

Before first use of Navigator you should review and set few program settings.

Program settings – Settings
You should setup:

MapText	parameters, which are displayed on the bottom of the Map window
Files	select waypoint and airspace files
Airspace	select which airspace is displayed and which airspace generates a warning

Hardware settings – Hardware
You should setup:

Instrument	instrument settings (type, com port number and baud rate)
Glider	select proper polar information

For more information check *Setup Navigator* section.

2.4.2. Simulator Mode

If Navigator is started without valid connection GPS NMEA source, Navigator will start in simulator mode. To allow easy practice navigation from home airfield and simulation of airspace warnings, user can enter a custom center and altitude. This window is accessed from the hardware icon on the main menu.

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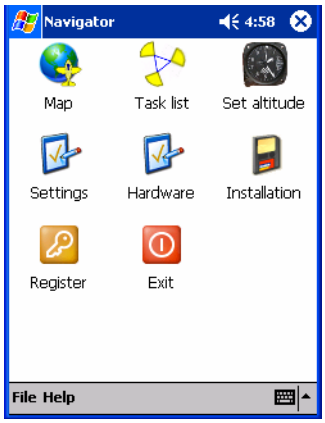
3. Fly with Navigator

3.1. Main menu

There are seven icons in the main menu window:



- **Map** map window
- **Task** select, open and edit tasks
- **Set altitude** set pressure datum for pressure altimeter
- **Settings** software settings (program settings)
- **Hardware** hardware settings (instrument and glider)
- **Installation** copy installation, update SW, predefined layouts
- **Register** registration window (icon is hidden after registration)
- **Exit** closes Navigator program

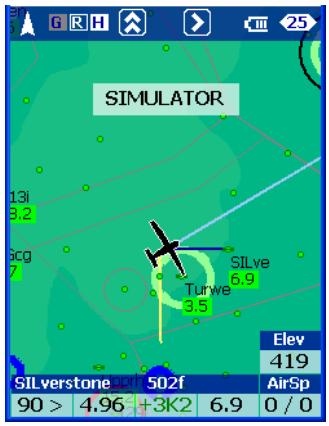
3.2. Map window

3.2.1. Map window

This is your main map window. User can select between no map, elevation map, differential elevation map and bitmap map. The map can be selected in two ways:

- **Toggle Map** – you can assign this function to hardware key and change between maps
- **MC Bal Window** – bottom right button changes between maps.

Regardless of the map selection, the Status Line is always displayed at top of map containing:



- **Compass Arrow** - change map orientation by tapping on the arrow.
  - **North,** map orientation is north side up.
  - **Tracking,** map orientation is tracking up (in direction of flight).
  - **Pan,** map orientation is north side up and you can move position with Tap & Drag function
- **G** – GPS status indicator – dark G on white square indicates GPS OK, if dark G on grey square GPS not OK
- **R** – IGC Recording status indicator – R displayed if recording enabled, dark R on white square indicates recording taking place
- **H** – Home airport indicator – dark H on white square indicates home airport is in reach, if not in reach white H on dark square is indicated
- Double up arrow – jump to main menu by tapping icon
- Single right arrow – Move to parameter screen by pressing on right arrow on the top of the screen
- Battery Symbol – Shows battery status - external power, 100%, 75%, 50%, and 25%. Exclamation mark shows less than 10% remaining.
- Scale Indicator - change scale by tapping on scale mark. If Waypoint or Task is selected, Navigator will select relevant scales to enable next selected waypoint or task waypoint to be displayed. Maximum auto zoom can be specified via Settings window, General tab.

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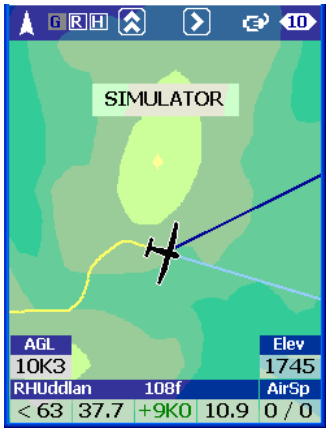
MapText boxes (displayed in the bottom) can be added and removed from Settings window. Most MapText boxes are active and you can open a new window by tapping on the MapText box.

Waypoints, airspace and the selected task are displayed on the map. Waypoints shown with a green bold font can be reached from the current position and altitude assuming pre-set altitude reserve and MC setting. Those that are not green cannot be reached without a further gain of altitude.

If final glide over terrain is not possible a red X is displayed on map and altitude in MapText box is underlined in red.

3.2.1.1. Color Elevation Maps

Program can display color maps in two modes - elevation or relative map. In elevation mode the color of the map reflects the altitude of the terrain. In relative mode terrain that is higher than aircraft current altitude has different color.



Ground elevation and altitude above ground level Maptext boxes may be useful in certain situations.

Warning: Navigator is not the tool for IFR navigation and because of that you should be careful when using differential map display for navigation. The altitude information on elevation maps may be inaccurate

Maps are available at flyWithCE Maps & Data web page.

3.2.1.2. Bitmap Maps

There are many sources of digital Bitmaps online and as they are updated regularly, they can be the most accurate VFR maps available. Navigator allows bitmaps to be used as the background on the map screen. The map\will be scaled and rotated according to settings

If a digital map is not available for your area, it is possible to use a bitmap editing program to scan maps and prepare a bitmap file with additional calibration information. Detailed step by step instructions are available on the flyWithCE Navigator page http:/www.flywithce.com/navigator.html.

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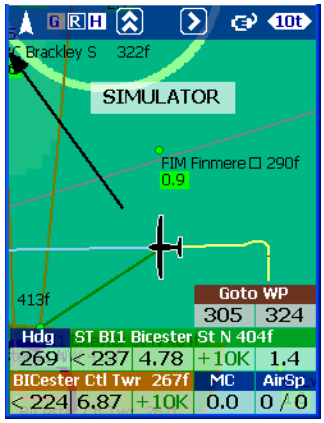
3.2.2. Tap & Drag

The “tap and drag” option is used several times in the Navigator program, as follows:

- Arrange MapText boxes
- change task waypoint position
- change task waypoint position inside AAT sector
- change speed and direction in simulator mode
- change map position in pan mode
- filter waypoints in Select waypoint window (using direction and distance)



To use the tap and drag option you should first tap on the screen and than drag your finger to the desired position. For some options you will see a special MapText box with additional data. It is important first to tap in the right place on the map window, as follows:

- press close to the waypoint to change the waypoint position
- press close to the waypoint inside AAT sector to change waypoint position
- press close to the glider icon to change speed and direction in simulator mode
- press anywhere on the map and drag this position to new position
- press anywhere on the map to filter the waypoints in Select waypoint window

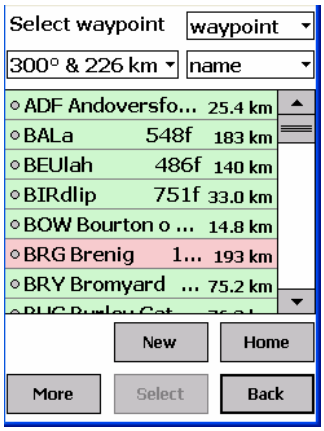
Because the waypoint database is often very large the last option will be helpful as it will enable you to lower the number of displayed waypoints. With this option you can display only those waypoints in a desired direction and distance from the current position. To achieve this filter of waypoints you press anywhere on the map but avoid the glider icon and task waypoints. Only the displayed distance and direction are important. After you lift the finger Select waypoint window will open and the filter will be applied to the waypoints. Best you try it for yourself!

3.2.3. Select waypoint window (GoTo)

There are two ways to open GoTo waypoint window:

1. Perform a Tap and Drag - all waypoints that match distance and direction criteria will be displayed. You can change selection and sort the order by changing values in the three combo boxes on the top of the screen.

2. Just press on the Goto MapText box. This option does not use a distance and direction filter



You can use cursor keys for navigation. First select one waypoint and then press the up or down button. Press left and right button to display all information about the waypoint;

Distance, arrival altitude, required glide ratio and course required.

Select the waypoint by pressing the Select button.

Waypoint background color indicates as follows:

red	you cannot reach this waypoint
green	you can reach this waypoint
grey	no altitude data - final glide cannot be calculated

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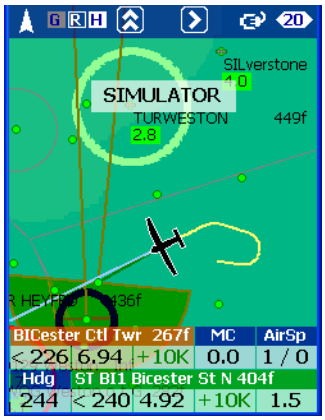
When computing a final glide the program uses altitude reserve and MC setting. If it is enabled the program will also use selected wind.

You can enter a new waypoint by pressing the *more* and then *new*. Program will generate new waypoint which will be added to the default waypoint database.

3.2.4. Home Airport

Your Home Airport can be selected and shown in the MapText box. Navigator will first display final glide information to the home airport. Add this feature by selecting the 'Home & Airport' or 'Home & Airport (gl. Ratio)' MapText in the Settings window



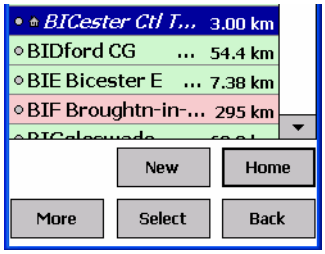
If you do not have enough altitude to reach home, the program will search for alternative airport. To select the home airport:

1. Open waypoints window
2. Find and select home airport
3. Press more button
4. Press Home button
5. Answer yes to question in popup window

A small house will appear in front of the selected airport

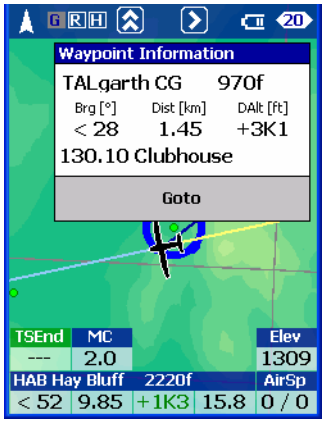
To deselect the home airport (and always display the closest airport):

1. Open waypoints window
2. Press more button
3. Press home button without selecting the waypoint first
4. Answer yes to question in popup window



3.2.5. Waypoint info

If you tap on a waypoint or airspace a pop-up window with basic information will be displayed. In the Waypoint information window you can press the *Goto* button on the bottom of the window and Navigator will display course and distance to selected waypoint in MapText box on the bottom of the map window. If you press on the airspace pop-up window airspace information will be displayed



Press anywhere on the map to close the popup window.

Note: Waypoint window takes precedence over Airspace window. Sometimes it is easier to check airspace information in the Airspace detector window.

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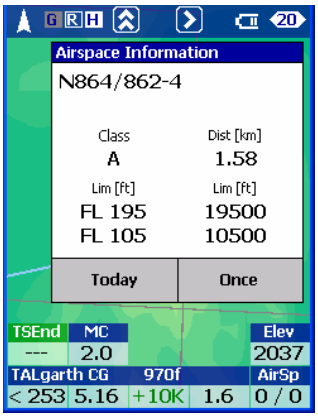
3.2.6. Airspace warnings

When you approach airspace that is closer than the declared limits in Settings dialog box an airspace warning dialog appears. On the bottom of the dialog you have two buttons, as follows:

- **Once** program will close warning dialog and will warn you again when you come close to this airspace next time
- **Today** program will close warning dialog and will not appear again until you restart the program

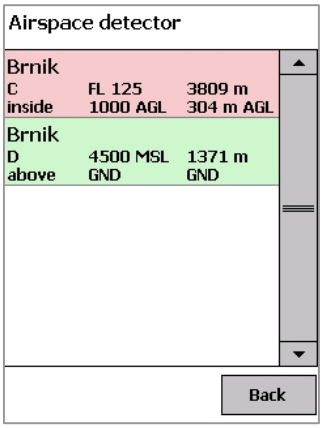


You can select limits and select airspace that will display warnings by using the *Settings - Airspace* dialog window.

3.2.7. Airspace detector window

The Navigator program tracks all airspace within 10km radius. The MapText detector box displays two numbers (right picture):

- first one represents that you are inside airspace
- the second represents the number of close airspace zones



If you press on the airspace detector MapText box a new window will open. In this window the list of all airspace that is closer than 10 km will be displayed.

Values displayed in distance field:

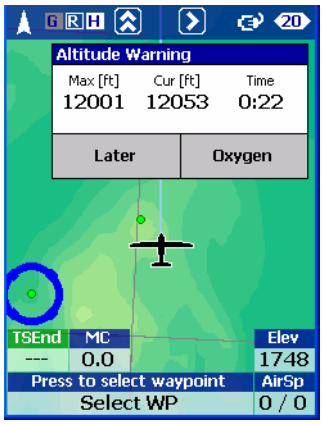
- **INSIDE** you are inside airspace
- **inside** you are probably inside airspace - check altitude limits
- **ABOVE** you are above airspace
- **BELOW** you are below airspace

Background color:

- **red** you are inside airspace
- **green** you are outside airspace

3.2.8. Altitude Alarm

The altitude alarm in Navigator gives a reminder to the pilot when the maximum safe altitude is exceeded and oxygen equipment should be used. By pressing the Later button the Navigator altitude will be set to remind the pilot again in 2 minutes time. The oxygen button will disable the alarm until then next time the maximum altitude is exceeded. When this happens the alarm will be displayed again.



In the dialog window three parameters are displayed:

- Maximum altitude (when alarm will be activated)
- Current altitude
- Time above maximum altitude

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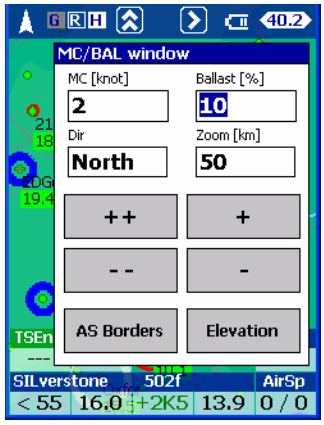
3.2.9. MC/BAL Window



If you press on the MC, Ballast or Volume (for LX1600) the MC/BAL window is displayed. On this window you can change following settings:

- MC setting
- Ballast Setting
- Volume (for LX1600)
- Screen orientation (North, Heading, Pan)
- Map zoom factor

Ballast is the percent of the overload of caculated. For example if your normal take of weight is 350 kg (glider and pilot) and you add an additional 50 l of water you should select:

- ((350 + 50) / 350 - 1), multiply by 100 = 14.2
- You should select 15% overload.

Switch airspace display

- AS Borders – display only airspace borders
- AS Show – display airspace and any color fill
- AS Hide – hide airspace

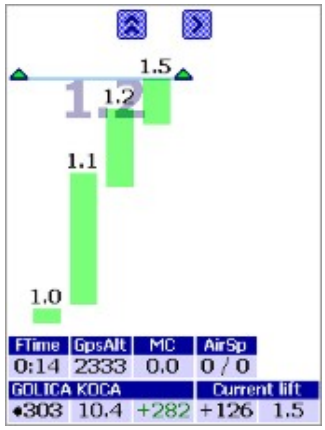
Switch Map Display

- Elevation
- Relative elevation
- Bitmap Map
- Map Hide

3.3. Parameters window

Thermal statistics and elevation graphs are displayed within parameter window. MapText boxes can be added. Press the right arrow symbol to display the parameter window.

3.3.1. Thermal Statistics



Thermal statistics can be viewed in the parameter window. Navigator calculates climbs when glider starts to circle – Barometer pressure is used from instrument, if not available GPS altitude is used.

The last 4 climbs are displayed on the screen together with the average lift value for those 4 climbs. You can use this value as the MC setting.

Last climbs are also displayed on the map together with the lift average. On the map they are displayed as blue arrow and the number beside the symbol is the average vario value for that climb.

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3.3.2. Elevation Graph

In the parameter window three elevation graphs can now be displayed. You have to press once on the lower half of the lift statistics/elevation graph to switch between these two. When elevation graphs are displayed, you can then switch between different graphs by pressing the upper left and upper right quarter. The graph themselves are self explanatory; for example a red line will now be displayed when you will fall under 100 m reserve altitude above the terrain.

3.4. Task

3.4.1. Task - basic

There is no limit at how many tasks you can create and when created they are stored in the default file. At this moment only SeeYou CUP file format is supported. Tasks are stopped by default after you run the program. The task tracking feature does not work from take off because you may fly through the start sector during the tow. Also if you fly close to the start sector the program will start beeping when you actually enter the sector.

When you have decided that you would like to start the tasks, you have two options:

- pressing to Task MapText box in Map window for 3 seconds (you will hear a beep)
- pressing *Start All* button in Task setting window

To restart selected Task press *Start* button in *Task – Settings* window. To restart all tasks press *Start All* button. During flight the program will start displaying progress of the task when you leave the start sector and will switch to the next leg when you will enter the pre-set sector of the turning point. The task is finished when you enter the finish sector correctly. The program will restart the task if you enter the start sector before you reach first waypoint sector or before you finish the task (if you have declared that task with start and finish waypoint).

3.4.2. Task - advanced

Assigned area tasks (AAT) are also supported. Default sector settings are declared in *Settings - Sector* dialog window. When you change one or more sector settings the task becomes an AAT task, the time allowed for the task can also be entered. In task list AAT text is displayed beside length and in waypoint list character * is displayed beside waypoint with changed sector settings. All changes are saved to default SeeYou CUP file.

After you start tasks the program will monitor your progress on all tasks. This will enable you to switch between tasks during the flight without danger of losing flight statistics. This feature enables you to:

- declare several options before flight
- declare the same task but with a different start sector

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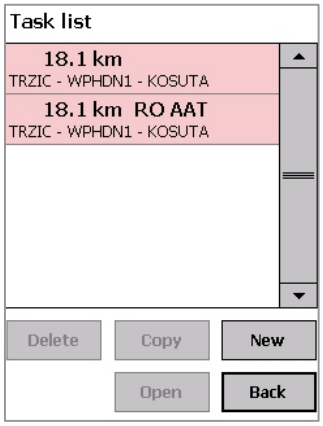
3.4.3. Task list

In this window user can select, copy or delete existing task. You can also create a new task. Area assigned tasks have *AAT* text beside length. If you copy a task that has already been started all statistics will be copied together with waypoints to the new task. Background color indicates as follows:

- **red** task not started
- **green** started task
- **blue** finished task

If *RO* text is displayed beside a task name this means that the task is not located in the default file which means that this task cannot be changed. To change this task you must first use "copy task option" and then "edit new task".



3.4.4. Edit and Run Task mode

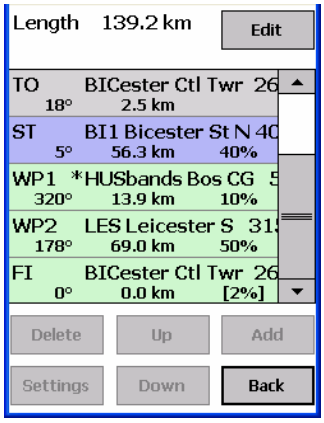
There is only one screen for task editing and tracking. With the button in the top right corner you can toggle between run and edit mode. In Edit mode you can modify the task and change sector settings for selected waypoint (AAT tasks). In Run mode the selected task is displayed.

3.4.4.1. Task - Edit mode

When you create a new task the program creates a template in which there is a place for take-off (TO), start (ST), waypoint (WP), finish (FI) and landing (LA) waypoints. This template will help you declare task. You will have to enter at least a start and finish point otherwise the task is invalid and cannot be saved to the database.

To add or change a waypoint you select any position in the task and press *Add* button. If you selected a waypoint the program will then add it to the task. Alternatively the program will allow you to change a waypoint previously declared. To do this use the *Delete* button to delete the declared waypoint from its selected position in the route and then with the *Up* and *Down* buttons you can change the waypoint sequence.

If you change waypoint sector settings (AAT tasks) the character * will be displayed before the waypoint name to indicate to you that the program knows that you are flying an AAT.



3.4.4.2. Task - Edit Settings

Different controls are enabled according to Edit / Run mode of the *Edit task* window.

In Edit mode you can change sector settings. Sector parameters are the same as in *Settings - Sector* dialog window. Program will use sector settings from this window if you select the check box beside *custom sector* option. To change the numerical values first select the edit box that you would like to change and then press the buttons on the right to change the value inside the edit box.

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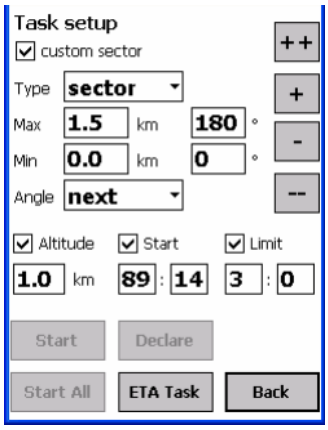
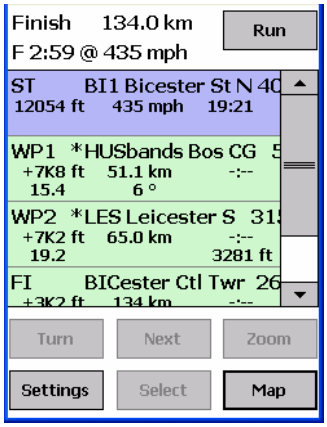
You can also declare the maximum altitude, a start time and for AAT tasks the minimum task time. In the MapText box the time to start is prefixed by an S, if prefixed by F then this is time left for AAT task.



- ETA – Navigator can calculate estimated time of arrival. Method of calculation is can be selected by pressing bottom middle button
- ETA MC – program use's current MC setting to calculate speed and ETA
- ETA RMC – program use's recommended MC setting based on last calculated average lift
- ETA Leg - program use's current leg average speed
- ETA Task – program use's task average speed

In Run mode buttons *Start* and *Start All* are enabled. If you press the *Start* button the program will restart the selected task. If you press *Start All* button the program will start or restart all tasks.

3.4.4.3. Task - Run mode



In Run mode the program displays all waypoints except take off, landing and inactive waypoints. Waypoint data is displayed in three rows with waypoint type and name being displayed in the first row.

Waypoint background color:

- **red** waypoint is out of reach
- **green** you can reach waypoint
- **blue** waypoint completed

If you would like to skip any waypoint you select the next waypoint and press *Next* button. To display parameters in Goto MapText, you should first select the waypoint and than press *Select* button. On the map the next sector is displayed in dark yellow. Other sectors are displayed in light yellow.

Data is displayed for completed waypoints as follows:

- second row
  - altitude
  - average speed to next waypoint
  - time of turn
- third row
  - leg time

Data displayed for remaining waypoints:

- second row
  - final glide altitude difference
  - distance to waypoint
  - ETA
- third row
  - required glide ratio to reach this waypoint
  - course (only to next waypoint)
  - altitude limit (if set)

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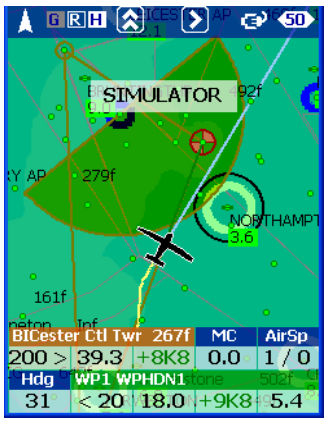
3.4.5. Task - Run mode - advanced

When you are flying an AAT task you can move a waypoint inside the AAT sector with Tap & Drag function. After this the new task is displayed and all task statistics are recalculated. You will notice a red circle around the moved waypoint; this indicates the change in task and that the auto change to the next leg feature has been turned off for this element of the flight only. Because of this you will have to press *Turn* button after you enter the AAT sector in order to display the navigation to the next waypoint.

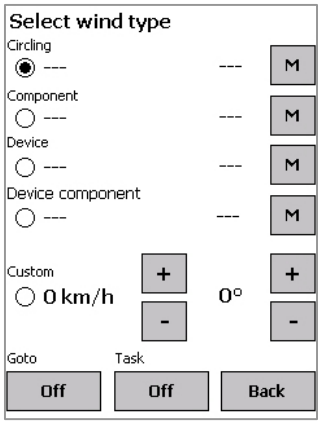


To simplify the waypoint movement you can select the waypoint and press the *Zoom* button; the program will then switch to pan mode and will display the selected sector. After you have changed the waypoint position you can change the map orientation and continue with the flight.

You can also change the position of the sector. To do this you have to enable "*Move non AAT waypoints*" option in *Settings - General* dialog window. You cannot change the position of the completed and AAT waypoints.

3.4.6. Wind

When wind is calculated the program will display wind strength and direction instead of --- text. By pressing to radio button on the left side you will select active wind which will then be displayed in MapText and will also be used in the final glide calculation



Program can calculate:

- wind strength and direction when circling – Circling
- wind strength during straight flight – Component

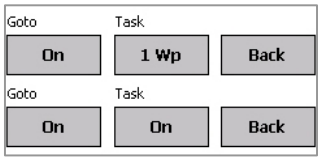
Component wind is calculated only if you have your Pocket PC connected to a LX Navigation LX160, LX1600, LX5000, LX7000, Borgelt B50 and Cambridge Aero 302.

Program compares ground speed and indicated speed. Because of that this method is only appropriate for final glides or when flying to a selected waypoint.

The program can also receive calculated wind from some instruments. This wind is displayed as third or fourth option. The pilot can also enter wind manually as a fifth option. If you only want to change the calculated wind you press the M button beside the selected wind. The calculated wind values will be copied to the Custom wind, where you can than change the speed and direction of the wind. If you select radio button below the Custom text, program will use custom wind settings for final glide calculation.

The following will help to explain the operating methodology.

On the bottom there are three buttons. By pressing the right button you return to the previous window. If you press left button you can select whether or not the program uses the selected wind for the final glide calculation to the selected waypoint. If you press the button in the middle you can select whether the program uses the selected wind for final glide to the waypoints on the selected task.



There is one extra option - *1 Wp*. If you select this option the program will use selected wind only for calculations to the next waypoint on task. Wind will not then be used for other waypoints.

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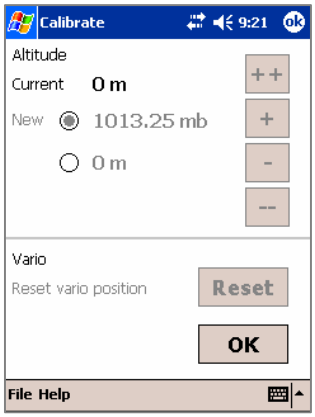
3.5. Set altitude dialog

In this dialog you can correct pressure altitude. You usually enter air pressure if you are in the air or altitude if you are on the ground. Change radio button position to enter pressure or altitude data. This option is disabled if your instrument does not transmit pressure altitude (GPS altitude cannot be used).



On the second half of the screen there is a Reset button, which resets altitude and speed setting for LX1600 instrument. This button is disabled in the air. To close this dialog you can press *OK* button (big button in the bottom or small button on the top right corner).

4. Setup Navigator

4.1. Settings dialog

Navigator sets up default settings at installation. User can also select a predefined layout:

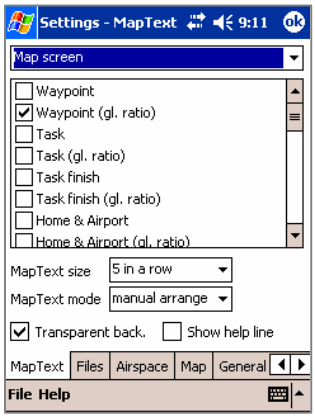
- **Recreational** – for general flying where you do not expect to fly tasks
- **Task and competition** – for cross country or competition flying

This will not change instrument, glider, unit and IGC file settings. User should check and set sector, unit, IGC settings appropriate to task or competition rules

In the Settings dialog you can change the program settings.

4.1.1. MapText

You can select which parameters will be displayed on the bottom of the map and parameters window. With the top combo box you can switch between Map window and Parameters window.



Parameters in grey are not available because they are not provided by the hardware to which your Pocket PC is connected (or they are not implemented in the current version).

On the bottom you can also select:

- the size of the MapText boxes
- Manual, auto arrange or locked text boxes
- whether they have white or transparent background
- whether you display the help line or not

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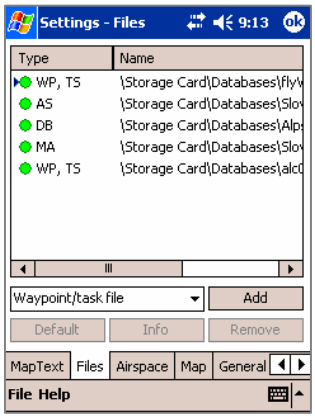
MapText box	Data
Waypoint	bearing, distance, alt. difference
Waypoint (gl.ratio)	bearing, distance, alt. difference, required glide ratio
Task	bearing, distance, alt. difference
Task (gl.ratio)	bearing, distance, alt. difference, required glide ratio
Task finish	distance, alt. difference
Task finish (gl. ratio)	distance, alt. difference, required glide ratio
Home & Airport	bearing, distance, alt. difference
Home & Airport (gl.ratio)	bearing, distance, alt. difference, required glide ratio
Airspace detector	flying inside, flying close to
Wind	wind speed and direction
Last lift	gained altitude and average vario
Time	current time
Flight time	flight time
Task Time	Prefix S shows time before start, Prefix F shows task time remaining
PPC battery	percentage of the PPC battery (100% - battery is full)
Main battery	voltage of the main battery
Volume	volume (used only for LX1600)
Ballast	ballast setting (tapping box opens MC/Bal window)
MC setting	MC setting (tapping box opens MC/Bal window)
Speed to fly	speed to fly
Altitude	pressure altitude if available, otherwise GPS altitude
Alternative altitude	toggle between altitude in second unit of measure or flight level
Terrain elevation	elevation of ground
Altitude above ground level	Altitude above ground level
GPS Ground speed	ground speed
GPS Heading	GPS heading (course)
GPS Status	GPS status
Speed	indicated speed
Vario	vario
Average vario	average vario
Total vario	total vario
Last climbs average	average vario for last 4 climbs

4.1.2. Files

In this window you can select waypoint (WP), airspace (AS), database (DB) and task (TS) files which will be displayed in Map window. When you are adding a new file first select file type in the combo box. Than press *Add* button and select file in File open dialog.



In the beginning of each row there is an icon, which indicates file status:

- **green light** file can be read and without errors
- **orange light** file is present but has arrors inside (format errors)
- **red light** file is missing or it can not be read

You should always set one of the CUP files in the list as the default file. This means, that all new waypoints and tasks will be added to this file. If not selected, those features will be disabled. To select new default file please first select CUP file from the list and than press *Default* button.

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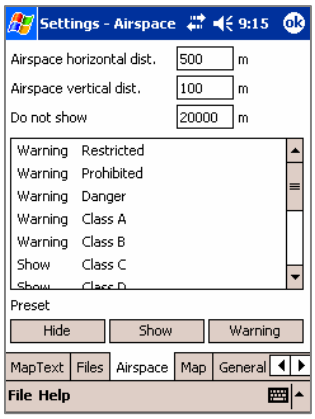
You will notice a small arrow to the left to the indicator. When you first install the program it will automatically generate new default **`flyWithCE.cup`** file.

Note: When you add a new airspace file, you should check *Settings - Airspace* settings. By default new airspace types are only listed in airspace list. For more information please read Airspace section.

4.1.3. Airspace



Airspace horizontal and vertical distance: User should determine airspace warning distance based on expected flying conditions. Warning will be generated at specified distance to airspace that user wishes to avoid.

Do not show above: No airspace is shown and airspace warnings generated above this altitude. This altitude should be set based on expected flying conditions and expected task area.

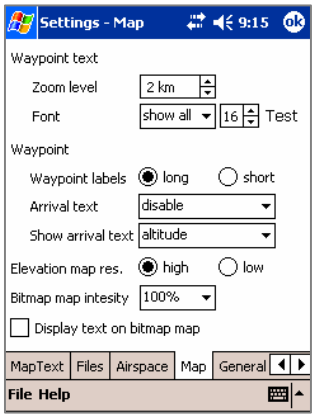
In the second half of the screen there is a list of all available airspace. The content of this list is determined by the types of airspace files that you have included in *Settings - File* dialog. When you add new airspace files in Files window you should check Airspace settings. By default new airspace types are not shown and will not generate warning messages.

The three buttons change airspace view and warnings for all airspace types,

- Hide – Airspace is hidden with NO warnings
- Show – Airspace is shown with NO warnings
- Airspace that is hidden will not generate warnings.

Each type can be selected individually by tapping the appropriate airspace line.

4.1.3.1. Map



This setting allows individual user to increase or decrease amount of detail on Map screen.

- Waypoint text size and type of waypoint shown can be changed for each zoom level.
- Waypoint labels can be full name or short abbreviation
- Arrival text for different types of waypoint can selected
- Arrival text can be switched between glide ratio needed or arrival altitude
- Elevation map resolution can be changed between high and low
- Bitmap intensity can be changed in steps between 40-100%
- Text can be displayed on/off on bitmap map

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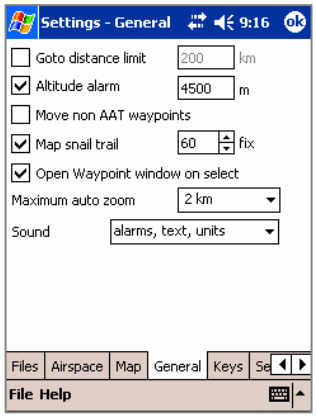
4.1.4. General



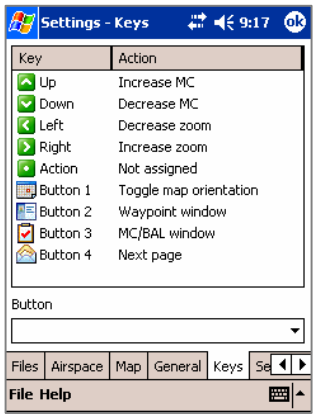
If you have a large waypoint database it takes quite a long time to display the Waypoint window. You can limit the search by selecting the first option with the maximum distance. The option of moving of non AAT waypoints is described in the *Task - Run mode - advanced* section.

To display snail trail select second option. The value determines the maximum length of the trail.

With option Open Waypoint windows on select program will open Waypoint window when you selected waypoint on map and there are several waypoints close together. Filter will be set so that only these waypoints will be displayed.

Maximum auto zoom can be restricted to user preference when approaching waypoints.

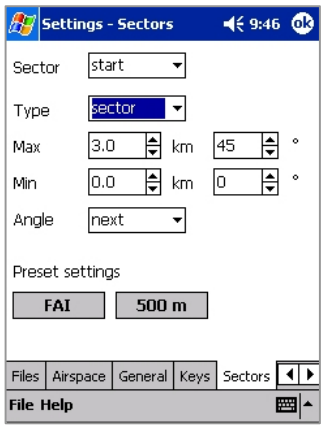
4.1.5. Map functions to hardware keys



Frequently used functions can be attributed to the hardware buttons on the front face of the Pocket PC device. This setting will not change your default general settings of application keys outside Navigator. You can assign functions to the following hardware keys:

- four application keys (dedicated individual keys)
- cursor keys (up, down, left, right)
- action key (press centre of cursor key)

4.1.6. Sectors



The definition of sectors is similar to similar programs. You can choose between line and sector shape. The sector shape consists of two overlapping sectors (min and max with radius and angle). Angle 0° is empty sector and angle 180° is whole circle. Minimum radius must be always less than maximum radius.

You can set the angle to:

- value (user defined angle0
- symmetrical
- next
- previous
- start waypoint

If you press FAI you will set sector parameters according to FAI regulations. The second button will set all sectors to circles with 500m radii.

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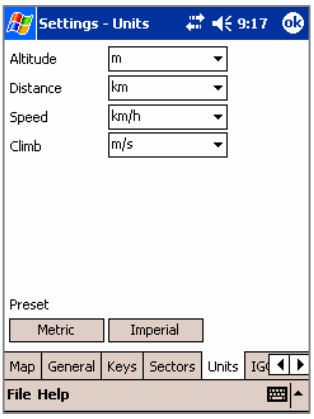
4.1.7. Units

You can change between imperial and metric units for altitude, distance, and speed and climb parameters.

Press the each parameter individually or press preset Metric or Imperial buttons to change all parameters.

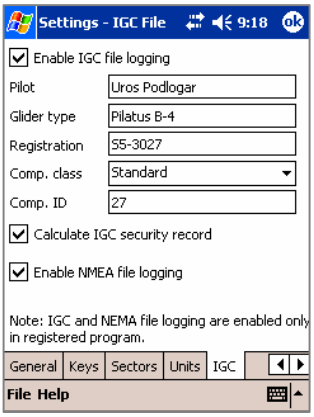


4.1.8. IGC

The Navigator program can write a simple IGC file that you can use later for flight analysis. Check that the IGC box is selected to enable logging. IGC security record can also be enabled/disabled. User should check local rules if such data can be used for badge or record flights.

NMEA file logging can also be enabled/disabled. NMEA file can than be used with GPS Simulator to repeat the actual flight**. NMEA file is usually very long (several megabytes) and because of that please make sure that you have enough free memory (usually used with memory card installation).**

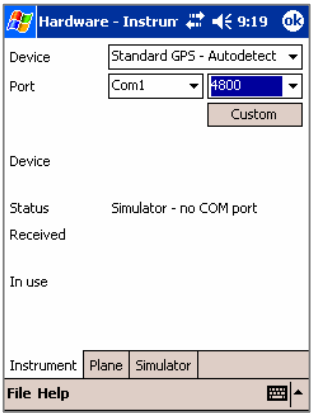
GPS positions are written with fixed 1 second intervals. Flight recordings can be found in \My Documents\Flights directory. You should write personal and glider data in the remaining edit fields.



4.2. Hardware dialog

4.2.1. Instrument window

In the top combo-box you can select the data source for the Navigator program. The most generic input is standard GPS. You can also select other data sources from the list. You can change the number of the Com port to that to which the external device is connected. GPS receivers that are plugged into compact flash port are usually communicating through Com2 and Navman is connected to Com4 or Com5 (you should also check the type of your iPAQ device). If you are using the LX1600 you should select Com port 1. When communication speed is different from 4800 bits per second you should change speed setting in third combo-box.



In the bottom of the page following information is displayed:

Device information	external device information (if available)
Status	current status
Received	received sentences
In use	sentences that are used by Navigator

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At start, and when you exit the Settings and Hardware dialogs feature, the program will open the serial port and wait for the signal from the instrument. If GPS sentences are detected it will switch automatically to navigation mode. If no sentences are detected than Navigator will stay in simulator mode.

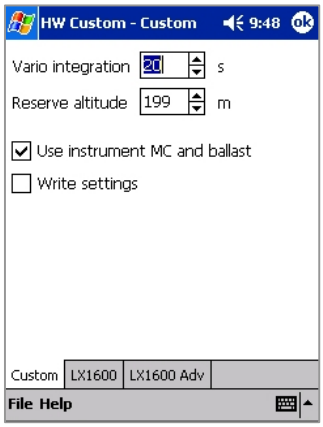
You should (if possible) limit transmitted sentences only to those displayed in In use section. You should be careful to ensure that, if other instruments connected to the GPS receiver, sentences used are the same as those used by Navigator.

Press *Custom* button for other instrument settings.

4.2.2. Custom settings - Custom tab

In this window there further settings used by Navigator,

Vario integration	time interval used for average vario calculation
Reserve altitude	reserve altitude used in final glide calculation



Navigator can use MC and ballast settings if they are available from the instrument output (LX Navigation LX160, LX5000, LX7000, Borgelt B50, Cambridge Aero 302).

If you select this option Navigator will use exclusively data received from the instrument. You will not be able to set different MC or ballast settings in Navigator.

The 2004 version of the LX1600 can be used also without an iPAQ. Because of this you will need to store default settings in the LX1600 non-volatile memory. To do this check *Write settings* option.

4.2.3. LX1600 custom settings

All LX1600 settings are set up in two dialog windows (they are displayed only if LX1600 instrument is selected):

- Custom settings – LX1600
- Custom settings – LX1600 advanced

On both windows there are several settings, which can be divided into two sets. The first set is usually different for each user (vario range, SC mode, SC speed, SC quiet zone, display settings, smart vario and audio settings). The second set of settings is usually defined by the instrument installation (SC type, Vario filter, TE compensation), and has to be first read by Pocket PC device before you can apply the changes.

This division of settings into two sets enables you to use LX1600 in gliding clubs. Glider pilots can set the instrument with the first set (their own settings) but the instrument main will be set the same in each glider if that has been done by the club with the initial installation. The Navigator program will always read the second set of settings (the club pre-sets) before it will enable you to change them. This feature will prevent you from downloading the incorrect values that may cause the instrument to malfunction.

Note: Versions 1.35 and later of Navigator support only LX1600 with firmware version 2.0 or higher.

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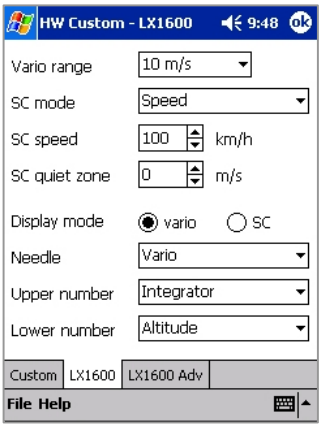
Custom settings - LX1600

This tab is available for the LX1600 instrument only, as follows:

Vario range vario range
SC mode mode of the speed command switch
SC speed if SC mode is set to Speed the instrument will change mode when reaching this value
SC quiet zone SC mode with no audio information

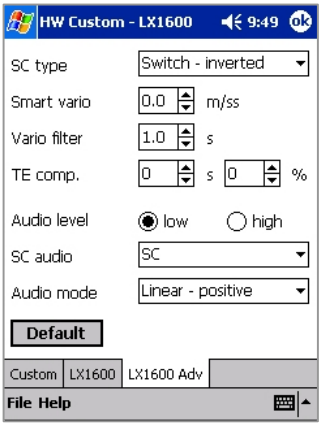


In the second half of the screen you can select which parameters are represented by the needle position and which parameters are displayed on the top and in the bottom number fields on the face of the LX 1600. These three parameters can be different for the vario and for the SC regime of flight.

4.2.4. LX1600 custom settings Adv.

This tab is available for LX1600 instrument only.

*SC type** switch type
Smart vario look at the LX1600 user's manual
*Vario filter** look at the LX1600 user's manual
*TE comp.** look at the LX1600 user's manual
Audio level low or high audio level
SC audio type of SC audio
Audio mode type of vario audio

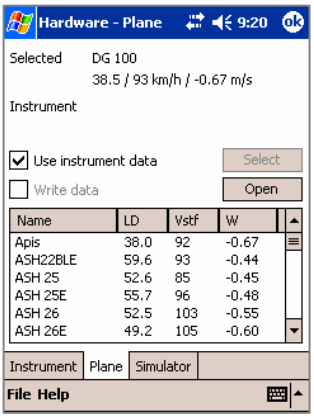


Settings marked with * can be set only when LX1600 instrument is connected to Pocket PC device.

At the bottom there is the *Default* button. If you press this button, default factory settings will be used to set the LX1600 instrument.

4.2.5. Plane (Glider polar)

First you should open polar file by pressing *Open* button. After that you should select a glider type and press *Select* button. All speed polar parameters are saved in one text file with **`pol`** extension. You can find a sample file **`Polar.pol`** in **`\My Documents\flyWithCE`** directory.



You can see two settings:

Selected Navigator polar settings
Instrument polar settings received from the instrument

If you select Use instrument data the program will use polar received from the instrument. If you will select Write data option the program will write polar settings to LX1600 non-volatile memory from the iPAQ.

In the sample polar file you will find speed polar declaration for most popular gliders. If you cannot find your glider, you can insert polar values inside polar file with standard text editor. A single comma separates columns.

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Column	Field name
1	glider name
2	wing span (in meters)
3	reserved
4	reserved
5	factor A of speed polar (always negative)
6	factor B of speed polar (always positive)
7	factor C of speed polar (always negative)

You can calculate speed polar parameters with the formula published in the late Dr. Helmut Reichmann`s book. You should take care to use the correct units and speed should be in km/h and vario in m/s. You can calculate speed polar parameters with program LXe from LX Navigation that is supplied with all LX instruments. You should change signs and divide A with 10000 and B with 100.

Example:

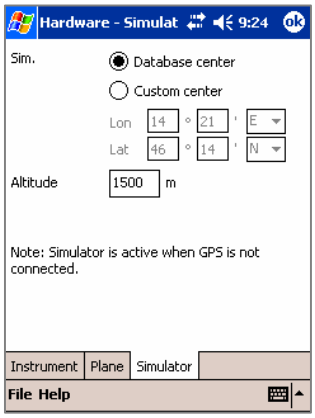
	LX Navigation LXe	Navigator
A	1.9	-0.00019
B	-3.2	0.032
C	2	-2

4.2.6. Simulator settings

Simulator settings can be changed in this dialog. You can select the position from where the simulator will start after you will start the Navigator. You can choose between

- center of the waypoint database
- preset position

Next setting is the altitude that it will be used. While using simulator you can not change this altitude.



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